



A massive 8.9/9.0 magnitude earthquake hit the Pacific Ocean near Honshu, Japan at around 2:46 PM (Japan Standard Time) on March 11, 2011 causing damage with blackouts, fire and tsunami. The tsunami wave then raced across the Pacific Ocean and arrived at many cities around the Pacific Rim. The map above, produced by the National Oceanic and Atmospheric Administration, shows the predicted arrival times in hours for the tsunami wave.

At 7:46 AM Pacific Standard Time on March 11, it resulted in 2.5 meter (8-foot) waves in some locations in Crescent City, California. Waves as tall as 3.5 meters (11-feet) were recorded in Kealakekua Bay, Hawaii at 3:24 AM Local Hawaii Time on March 11. The distance from the epicenter near Honshu, Japan to Crescent City is 8,020 km; to Kealakekua Bay, Hawaii is 6,640 km.

Because these destinations are not all in the same time zone, we have to also include this information: 6:00 AM (Japan Standard Time) on March 11, is the same as 11:00 AM March 10 (Hawaii Standard Time) in Hawaii, and 1:00 PM, March 10 (Pacific Standard Time) in Crescent City.

Problem 1 - At what local time and date did the earthquake occur in A) Hawaii?
B) Crescent City?

Problem 2 - How long did it take the tsunami to reach each of the landfalls?

Problem 3 - What was the average speed of the tsunami based on the two estimates?